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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,272	06/27/2003	Jeffrey E. Fink	BING-1-1011	8301

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EXAMINER	
SELLMAN, CACHET I	

ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 03/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/608,272	FINK ET AL.	
	Examiner	Art Unit	
	Cachet I. Sellman	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 1/17/2006 cis.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-16 and 18-48* is/are pending in the application.

4a) Of the above claim(s) *30-48* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-16 and 18-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 30-48 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/17/2006.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2, 4-8, 10-12, 15-16, 21-25 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howell et al. (US 6107008) in view of Ederer (US 6193922 B1).

Howell et al. discloses a method for changing a property of a layer-formed plastic part comprised of at least one plastic material that comprises providing an electromagnetic radiation source; positioning the layer formed plastic part within a potential exposure range of the electromagnetic radiation source; determining an exposure of radiation operable to change a property of the layer formed plastic part from an existing state to an altered state; and exposing the layer formed plastic part to the exposure of radiation to change the property to the altered state (column 2, lines 26-38).

Howell et al. does not teach forming the layer-formed plastic part using at least one of selective laser sintering (SLS) and fused deposition modeling (FDM) as required by **claims 1 and 15**.

Ederer discloses a method for forming a three dimensional body from a computer data model by computer controlled layer-wise deposition material. Ederer discloses that stereolithography is limited because of its high expenses for equipment, process, and consumables and because additional equipment for cleaning of the models form liquid resin. Ederer discloses that selective laser sintering avoids the disadvantages of using stereolithography because the plastic powder serves as a supporting means and blowing off the unmelted powder after completing the model is sufficient in order to get the finished product (column 1, lines 24-65).

It would have been obvious to one having ordinary skill in the are the modify the process of Howell et al. to include the post-curing the object made by using selective laser sintering of Ederer. One would have been motivated to do so because both teach processes using three dimensional plastic parts that are formed using a layer by layer process and Ederer further teaches using selective laser sintering over stereolithography because it is less expensive therefore one would have a reasonable expectation of success in modifying the plastic part.

Howell et al. teaches that the electron beam source consists of an electron gun where electrons are electromagnetically guided and accelerated forming an electron beam through an accelerating section until they achieve a desired energy level. Bending magnets are used at the end of the accelerating section to apply a magnetic field to the beam to effect bending. Varying the magnetic field in a controlled manner causes the bending angle to change resulting in a scanning effect (column 3, lines 24-42 and Figure 1) as required by **claims 4, 6-8, 12 and 23-25**. Howell et al. further teaches that the object can be moved perpendicular to the beam by way of a conveyor (column 3, lines 42-45) as required by **claims 5 and 21-22**. The energy provided by the electron beam is enough to affect chemical changes such as cross-linking and alter the "property profile" of the object. The property profile includes mechanical properties (such as compressive strength), chemical resistance, and moisture resistance (column 4,lines 1-14) as required by **claims 10-11 and 28**.

4. Claims 9 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howell et al. (US 6107008) in view of Ederer (US 6193922 B1) as applied to claims 1-2, 4-8, 10-12, 15-16, 21-25 and 28 as stated above, and further in view of Roberts (US 4156538).

The teachings of Howell et al. in view of Ederer as applied to claims 1-2, 4-8, 10-12, 15-16, 21-25 and 28 are as stated above.

Howell et al. in view of Ederer does not teach placing a shield between the layer formed part and the radiation source to control the exposure as required by **claims 9 and 26**.

Roberts teaches a process for making a plastic book cover in which the cover is exposed to electron beam radiation to crosslink the cover to improve its elasticity and stiffness. Only certain areas of the book covers are exposed to the electron beam radiation, in order to achieve this selective exposure a shield is used. The shield is placed between the radiation source and the object being irradiated and it allows for only certain parts of the object to be exposed to the radiation.

5. Claims 1, 2,13-23, 27, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanna et al. (US 6574523 B1) in view of Ederer (US 6193922 B1).

Hanna et al. discloses a process for forming a plastic three-dimensional object using stereolithography method where a UV curable liquid is exposed to a UV light source which produces a spot on the surface of the liquid that is movable across the surface by mirrors (column 4, lines 1-5, and 18-22) to solidify the liquid creating a plastic layer; once the layer is formed the platform is moved down so another layer can be formed (column 4, lines 53-59); and this process is repeated until the entire three dimensional object is formed. Hanna et al. teaches that parts with desired thermal resistance and durability in discrete regions of the part can be created by selectively

controlling process parameters affecting mechanical properties during the build process (column 6, lines 36-40). Hanna et al. discloses a method of how a layer wise modification of properties can be achieved.

Hanna et al. does not teach that the plastic part is formed using at least one of selective laser sintering and fused deposition modeling as required by **claims 1 and 15**.

Ederer discloses a method for forming a three dimensional body from a computer data model by computer controlled layer-wise deposition material. Ederer discloses that stereolithography is limited because of its high expenses for equipment, process, and consumables and because additional equipment for cleaning of the models form liquid resin. Ederer discloses that selective laser sintering avoids the disadvantages of using stereolithography because the plastic powder serves as a supporting means and blowing off the unmelted powder after completing the model is sufficient in order to get the finished product (column 1, lines 24-65).

It would have been obvious to one having ordinary skill in the are the modify the process of Hanna et al. to include the post-curing the object made by using selective laser sintering of Ederer. One would have been motivated to do so because both teach processes using three dimensional plastic parts that are formed using a layer by layer process and Ederer further teaches using selective laser sintering over

stereolithography because it is less expensive therefore one would have a reasonable expectation of success in modifying the plastic part.

As stated above Hanna disclose that the exposure is determined by recognizing the existing state of the property of the layer; identifying a desired state of the property; identifying the exposure of radiation to change the property of the layer such that the altered state reaches the desired state as required by **claims 2 and 16**.

Hanna et al. discloses that a part can be produced that has a high temperature property only where required while the remainder of the part is built using a standard method by varying the exposure which assures a firm easy to handle part (column 7, lines 22-28 and Figure 2). In another example, Hanna et al shows by changing the way the laser exposure is applied to the material can increase the durability of the part (Table II); one layer of the part is built using a power of 800 mW and a spot size of 0.030 inches resulting in a tensile elongation of 4% and impact strength of 27 J/m; then a layer is formed using a laser power of 100 mW as a laser spot size of 0.010 inches resulting in a tensile elongation of 10% and impact strength of 37 j/m (column 7, lines 23-65; column 10 lines 4-56; Figures 2 and 4) as required by **claims 13, 14, 18, 19, 20, 27, and 29**. As stated above Hanna et al discloses that the source of electromagnetic radiation is moved relative to the layer as required by **claim 23**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process for curing a plastic part using electron irradiation taught by Howell et al. in view of Ederer to include controlling the radiation source using the shield of Roberts to selectively irradiate certain parts of the object. One would have been motivated to do so because both Howell et al. in view of Ederer and Roberts teach processes used for changing a property of a plastic part by using a controlled radiation source to treat a select area of a plastic part, therefore one would have a reasonable expectation of success sin making a plastic object that has improved properties in select areas.

Response to Arguments

6. Applicant's arguments, see page 12 the third paragraph, filed January 17, 2006, with respect to claim 3 have been fully considered and are persuasive. The rejection of claim 3 has been withdrawn because Howell et al. teaches the use of stereolithography for forming the layer formed plastic. Howell does not disclose the use of selective laser sintering or fused deposition modeling for forming a layer formed plastic as was required by claim 3.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cachet I. Sellman whose telephone number is 571-272-0691. The examiner can normally be reached on Monday through Friday, 7:00 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Cachet Sellman
Patent Examiner
AU 1762

TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER